[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2012-0218]

Comparative Environmental Evaluation of Alternatives for Handling Low-Level Radioactive Waste Spent Ion Exchange Resins from Commercial Nuclear Power Plants

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft report; request for comment.

SUMMARY: Notice is hereby given that the U.S. Nuclear Regulatory Commission (NRC or the Commission) is issuing for public comment the Draft Comparative Environmental Evaluation of Alternatives for Handling Low-Level Radioactive Waste Spent Ion Exchange Resins from Commercial Nuclear Power Reactors.

DATES: Please submit comments by January 18, 2013. Comments received after this date will be considered if it is practical to do so, but the NRC is able to assure consideration only for comments received on or before this date.

ADDRESSES: You may access information and comment submissions related to this document, which the NRC possesses and are publically available, by searching on *http://www.regulations.gov* under Docket ID **NRC-2012-0218**. You may submit comments by any of the following methods:

- **Federal Rulemaking Web site:** Go to *http://www.regulations.gov* and search for Docket ID **NRC-2012-XXXX**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-492-3668; e-mail: *Carol.Gallagher@nrc.gov*.

- **Mail comments to:** Cindy Bladey, Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: TWB-05-B01M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

- **Fax comments to:** RADB at 301-492-3446.

For additional direction on accessing information and submitting comments, see "Accessing Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Stephen Lemont, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-5163; e-mail: *Stephen.Lemont@nrc.gov*.

SUPPLEMENTARY INFORMATION:

I. Accessing Information and Submitting Comments

A. Accessing Information

Please refer to Docket ID **NRC- NRC-2012-0218** when contacting the NRC about the availability of information regarding this document. You may access information related to this document by any of the following methods:

- **Federal Rulemaking Web site:** Go to *http://www.regulations.gov* and search for Docket ID **NRC- NRC-2012-0218**.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**

You may access publicly-available documents online in the NRC Library at *http://www.nrc.gov/reading-rm/adams.html*. To begin the search, select "*ADAMS Public Documents*" and then select "*Begin Web-based ADAMS Search*." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to *pdr.resource@nrc.gov*. The ADAMS accession number for each document referenced in this notice is provided the first time that a document is referenced. In addition, for the convenience of the reader, the ADAMS accession numbers for these documents are provided in Section II, "Availability of Documents," of this document.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID **NRC- NRC-2012-0218** in the subject line of your comment submission, in order to ensure that the NRC is able to make your comment submission available to the public in this docket.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at *http://www.regulations.gov* as well as enter the comment submissions into ADAMS, and the NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that

they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment submissions into ADAMS.

II. Availability of Documents

ADAMS Accession Number	Document Title
ML12256A965	Draft Comparative Environmental Evaluation of Alternatives for Handling Low-Level Radioactive Waste Spent Ion Exchange Resins from Commercial Nuclear Power Plants
ML090410246	SECY-10-0043, "Blending of Low-Level Radioactive Waste," April 7, 2010
ML102861764	SRM-SECY-10-0043, "Staff Requirements - SECY-10-0043 - Blending of Low-Level Radioactive Waste," October 13, 2010
ML100220019	Official Transcript of Proceedings, "Public Meeting on Low-Level Radioactive Waste, Rockville, Maryland," January 14, 2010

III. Further Information

In the draft report, the NRC staff identifies and compares potential environmental impacts of six alternatives for managing low-level radioactive waste (LLRW) spent ion exchange resins (IERs) generated at commercial nuclear power plants (NPPs). This comparative environmental evaluation has been conducted consistent with Option 2 in the NRC staff's paper for the Commission, SECY-10-0043, "Blending of Low-Level Radioactive Waste," April 7, 2010 (ADAMS Accession No. ML090410246), which identified policy, safety, and regulatory issues

associated with LLRW blending, provided options for an NRC blending position, and proposed that the NRC staff revise the Commission position on blending to be risk-informed and performance based. Option 2 of SECY-10-0043 was approved by the Commission in the October 13, 2010 Staff Requirements Memorandum, SRM-SECY-10-0043, "Staff Requirements - SECY-10-0043 - Blending of Low-Level Radioactive Waste" (ADAMS Accession No. ML102861764).

Additionally, in consideration of stakeholder concerns expressed regarding potential environmental impacts associated with the blending of certain LLRW, as documented in the NRC's Official Transcript of its January 14, 2010, "Public Meeting on Blending of Low-Level Radioactive Waste" (ADAMS Accession No. ML100220019), in SECY-10-0043, Option 2, the NRC staff also proposed that "…disposal of blended ion exchange resins from a central processing facility would be compared to direct disposal of the resins, onsite storage of certain wastes when disposal is not possible and further volume reduction of the Class B and C concentration resins." The purpose of the draft report is to address this comparison of IER waste handling alternatives. The six alternatives evaluated in the draft report include the four identified by the NRC staff in SECY-10-0043, plus two additional alternatives that represent variations on the disposal of blended ion exchange resins from a central processing facility and volume reduction of the Class B and C concentration resins alternatives. The assumptions and methodologies used in the staff's evaluation and the evaluation results are documented in the draft report. Additional information regarding the draft report is presented in Section IV, "Draft Report Overview," of this document.

IV. Draft Report Overview

In the comparative environmental evaluation presented in the draft report, the alternatives are described and potential environmental impacts of the alternatives are: (1) identified for a range of resource or impact areas (e.g., air quality, ecological resources, public and occupational health, transportation, waste management, water resources); and (2) compared in terms of their relative potential effects on human health and the environment. For reasons discussed in the draft report, the six alternatives are generic and not location-specific, and the comparative environmental evaluation of the alternatives is largely qualitative. An exception is that potential transportation impacts are assessed both quantitatively and qualitatively.

Furthermore, the evaluation is based on conservative, often bounding assumptions regarding the alternatives and various aspects of the analysis. This approach is consistent with the assessment of generic, non-location-specific alternatives, for which exact data and information would not be available. Consequently, the staff used its professional knowledge, experience, and judgment to establish reasonable technical considerations, estimations, and approximations with regard to how the alternatives were described, would be implemented, and would potentially affect human health and the environment. The NRC staff also took care not to underestimate potential environmental effects and instead worked to bound the possible range of outcomes in most cases. Thus, the potential impacts of the six alternatives, if implemented in actual practice, would be expected to be of somewhat lesser magnitude than described in the draft report.

Ion exchange resins are small, bead-like materials used at commercial NPPs to capture radioactive contaminants dissolved in water used in plant operations. Over time, the IERs lose

their ability to remove the contaminants from the water and the resins become “spent” and must be removed and replaced. The NRC defines three classes of LLRW—Class A, Class B, and Class C—in its regulations in section 61.55 of Title 10 of the *Code of Federal Regulations* (10 CFR), “Waste classification.” Of the three classes, Class A LLRW is the least hazardous and Class C is the most hazardous. Disposal facilities for LLRW are licensed to accept one or more of these classes of waste. Waste that exceeds the Class C limits is not generally acceptable for near-surface disposal. Licensees do not allow IERs to exceed the Class C limits, and waste at greater-than-Class C limits is not considered in this report. Spent IERs are managed as LLRW, and are classified as Class A, Class B, or Class C when shipped for disposal, depending on the concentrations and radioactivity levels of radionuclides present.

Currently, there are four licensed, operating LLRW disposal facilities in the United States. One of these facilities is licensed to dispose of, and can accept, Class A LLRW from most states. The other three facilities are licensed to dispose of Class A, B, and C LLRW, but can accept these wastes only from a limited number of states, although one of these facilities may receive approval to import LLRW from additional states in the future. As a result, all U.S. commercial NPPs (which currently include 104 operating nuclear reactors at 65 NPP locations) can dispose of their Class A LLRW spent IERs, but more than 40 of the 65 operating NPPs do not currently have access to a disposal facility for their Class B and C concentration spent IERs. Given this situation, LLRW processing and waste disposal companies are exploring alternatives for managing Class B and C concentration spent IERs.

One of these alternatives is to use a centralized processing facility to blend small volumes of higher-activity Class B and C concentration spent IERs with larger volumes of low activity Class A concentration spent IERs to produce Class A waste. Potential environmental

impacts of this alternative, as compared to potential impacts of the other alternatives, are described in the draft report.

Specifically, the six alternatives evaluated in the draft report are:

- Alternative 1A—Direct disposal of blended Class A, B, and C spent IER LLRW from a central processing facility where mechanical mixing would be used to blend the spent IERs to produce Class A waste;
- Alternative 1B—Direct disposal of blended Class A, B, and C spent IER LLRW from a central processing facility where thermal processing would be used to blend the spent IERs to produce Class A waste;
- Alternative 2—Direct disposal of the Class A, B, and C spent IER LLRW (without blending);
- Alternative 3—Direct disposal of the Class A spent IERs, with long-term onsite storage of the Class B and C concentration spent IERs at the NPPs (including construction (expansion) of the waste storage facilities at the NPPs), followed by disposal of the Class B and C spent IERs at the end of the long-term storage period;
- Alternative 4A—Direct disposal of the Class A spent IERs, with volume reduction (by thermal processing) of the Class B and C concentration spent IERs, followed by long-term storage of the volume-reduced Class B and C concentration spent IERs (including construction of a storage facility at an existing LLRW disposal site), and then disposal at the end of the long-term storage period; and
- Alternative 4B—Direct disposal of the Class A spent IERs, with volume reduction (by thermal processing) of the Class B and C concentration spent IERs, then disposal of the volume-reduced Class B and C spent IERs.

As mentioned earlier, the comparative environmental evaluation is based on a number of assumptions. For example, the baseline for the evaluation is current land use. This means that, with the exception of the construction of the long-term waste storage facilities considered in Alternatives 3 and 4A, the evaluation assumes that no new IER handling, processing, and disposal facilities will be constructed and, therefore, does not revisit the impacts of construction of any of these facilities. In addition, the evaluation assumes that these facilities operate under licenses from the NRC or an Agreement State, and that all activities conducted in the alternatives would be in compliance with all applicable Federal, State, and local legal and regulatory requirements.

Additionally, each alternative is considered individually in the evaluation (i.e., each alternative is assumed to be implemented at the exclusion of all the other alternatives). There is no mix of alternatives, and all spent IERs generated at all 65 NPPs are assumed to be managed under each alternative. The staff recognizes that Agreement State requirements and other factors could prevent some NPPs from using some alternatives, and that in actual practice, all spent IERs generated at all 65 NPPs would not be managed under any single alternative. Therefore, the assumption that all spent IERs are managed under each alternative results in conservative estimates of the potential impacts of each alternative.

The assumptions used in this evaluation, such as those previously described, are reasonable and consistent with SECY-10-0043, Option 2, which established the basis for the comparative environmental evaluation. These assumptions are also necessary to place all six alternatives on a relatively equal footing, which helps avoid bias in the results of the evaluation.

The assessment of potential environmental effects of the six alternatives evaluated the following resource or impact areas: air quality, ecological resources, historic and cultural resources, noise, public and occupational health, soil, transportation, waste management, and

water resources. The following resource and impact areas were eliminated from detailed consideration for reasons discussed in the draft report: accidents and other off-normal conditions, environmental justice, geology and minerals, land use, socioeconomics, and visual and scenic resources. In addition, to the extent practicable, the evaluation of potential environmental impacts identifies and accounts for generally accepted impact mitigation measures in each resource or impact area that would typically be employed in general industry practice. In accordance with the standard of significance that has been established by the NRC for assessing environmental impacts, using the standards of the Council on Environmental Quality's regulations in 40 CFR 1508.27 as a basis, each impact for each alternative was assigned one of the following three significance levels:

- SMALL. The environmental effects are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE. The environmental effects are sufficient to noticeably alter, but not destabilize important attributes of the resource.
- LARGE. The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The evaluation concludes that the potential environmental impacts of all six alternatives in all resource and impact areas would be SMALL, with the exception of potential impacts on

historic and cultural resources from construction of long-term waste storage facilities in Alternatives 3 and 4A, which could be SMALL to MODERATE. Reasons for the mostly SMALL impacts, by resource or impact area, are discussed in the Draft Report.

Dated at Rockville, Maryland, this 12th day of September, 2012.

For the Nuclear Regulatory Commission.

/RA/

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